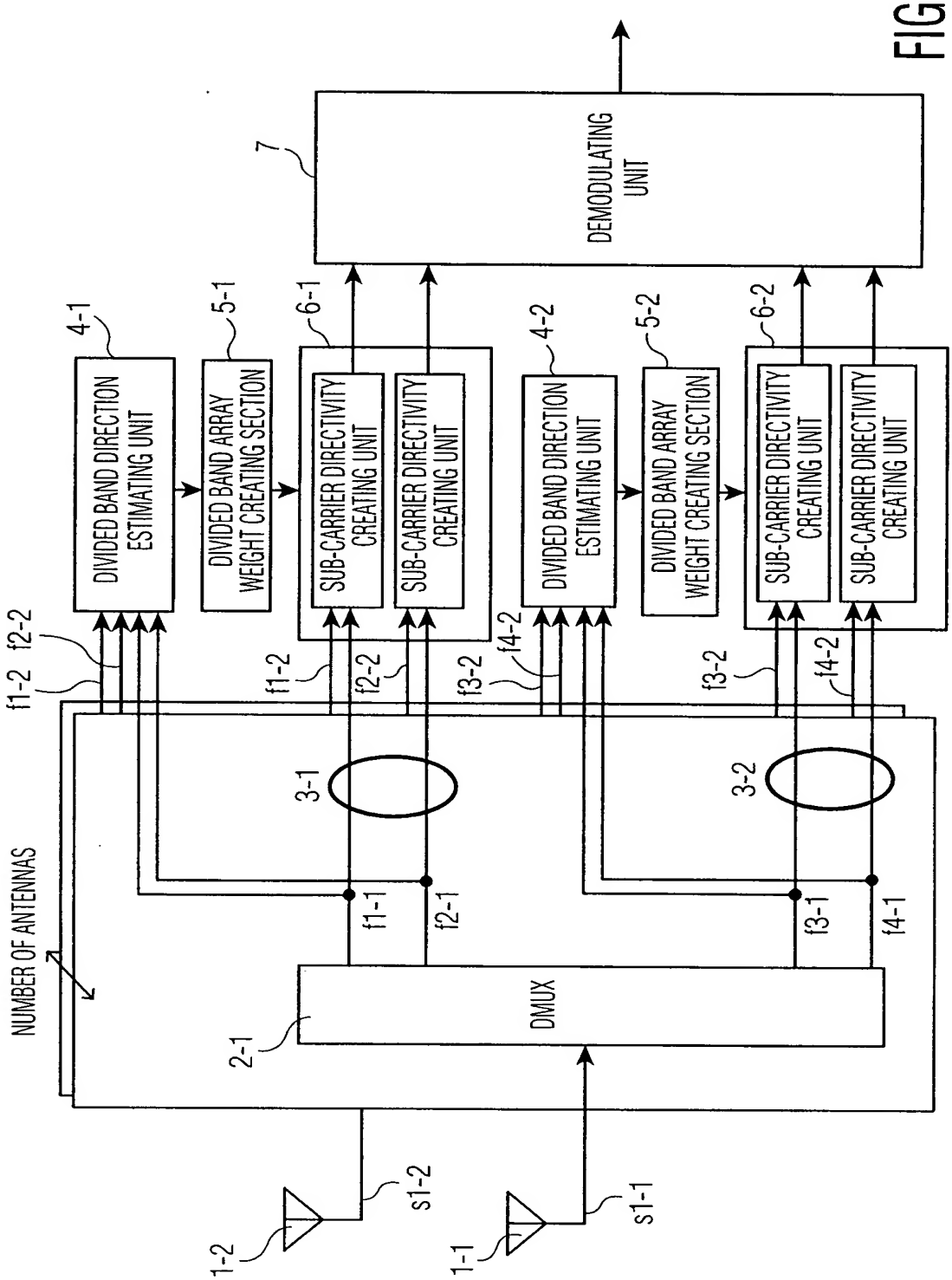
OIPE
MAY 10 2007
PATENT & TRADEMARK OFFICE

FIG. 1



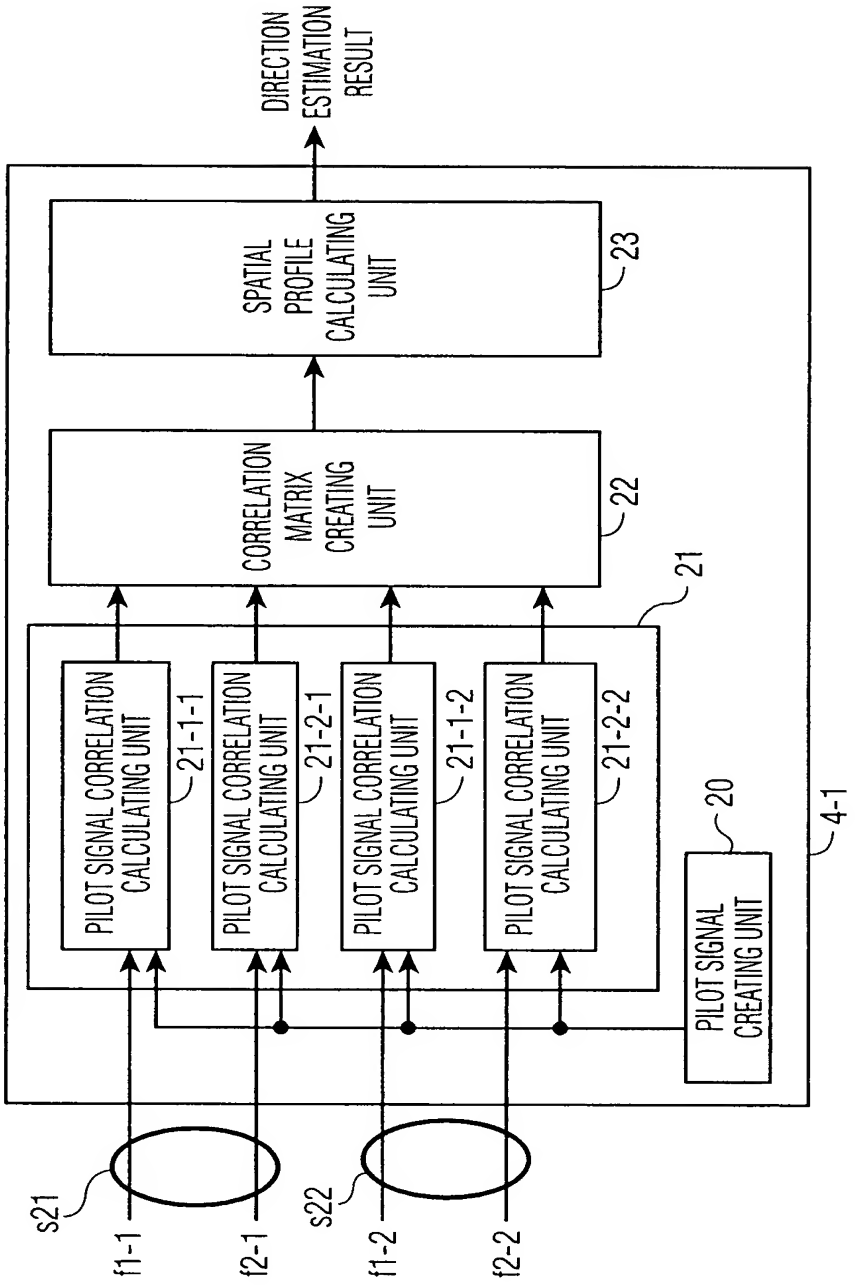

DIRECTION ESTIMATION RESULT
SPATIAL PROFILE CALCULATING UNIT
23
CORRELATION MATRIX CREATING UNIT
22
21
PILOT SIGNAL CORRELATION CALCULATING UNIT
21-1-1
PILOT SIGNAL CORRELATION CALCULATING UNIT
21-2-1
PILOT SIGNAL CORRELATION CALCULATING UNIT
21-1-2
PILOT SIGNAL CORRELATION CALCULATING UNIT
21-2-2
PILOT SIGNAL CREATING UNIT
20
4-1
s21
s22
f1-1
f2-1
f1-2
f2-2

FIG. 2

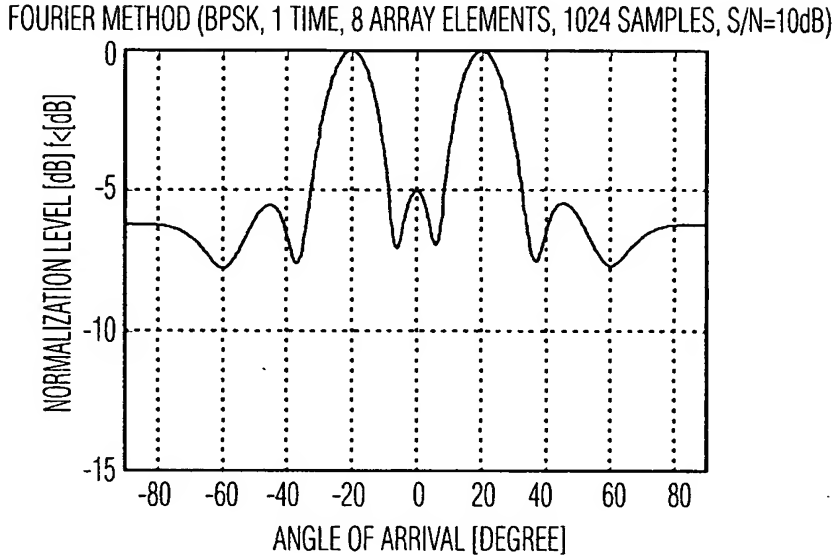

FOURIER METHOD (BPSK, 1 TIME, 8 ARRAY ELEMENTS, 1024 SAMPLES, S/N=10dB)
NORMALIZATION LEVEL [dB] K<[dB]
0
-5
-10
-15
-80
-60
-40
-20
0
20
40
60
80
ANGLE OF ARRIVAL [DEGREE]

FIG. 3A

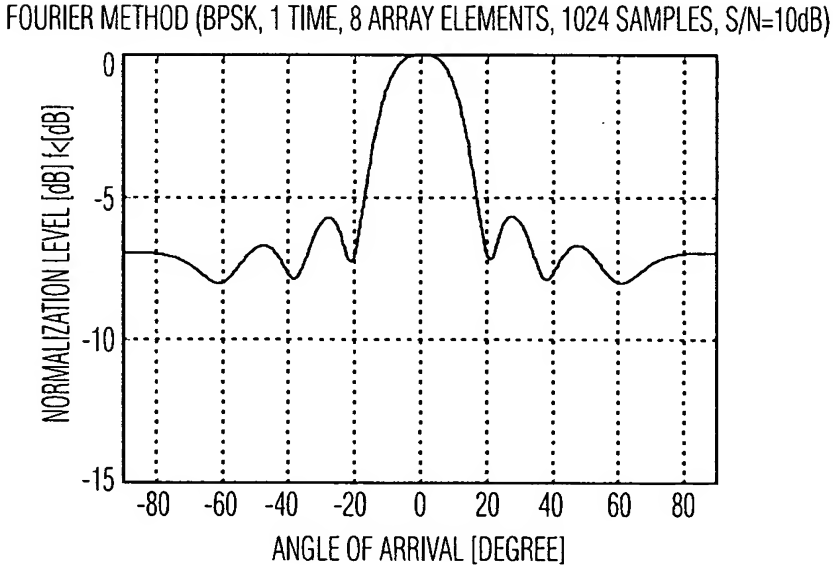

FOURIER METHOD (BPSK, 1 TIME, 8 ARRAY ELEMENTS, 1024 SAMPLES, S/N=10dB)
NORMALIZATION LEVEL [dB] K<[dB]
0
-5
-10
-15
-80
-60
-40
-20
0
20
40
60
80
ANGLE OF ARRIVAL [DEGREE]

FIG. 3B

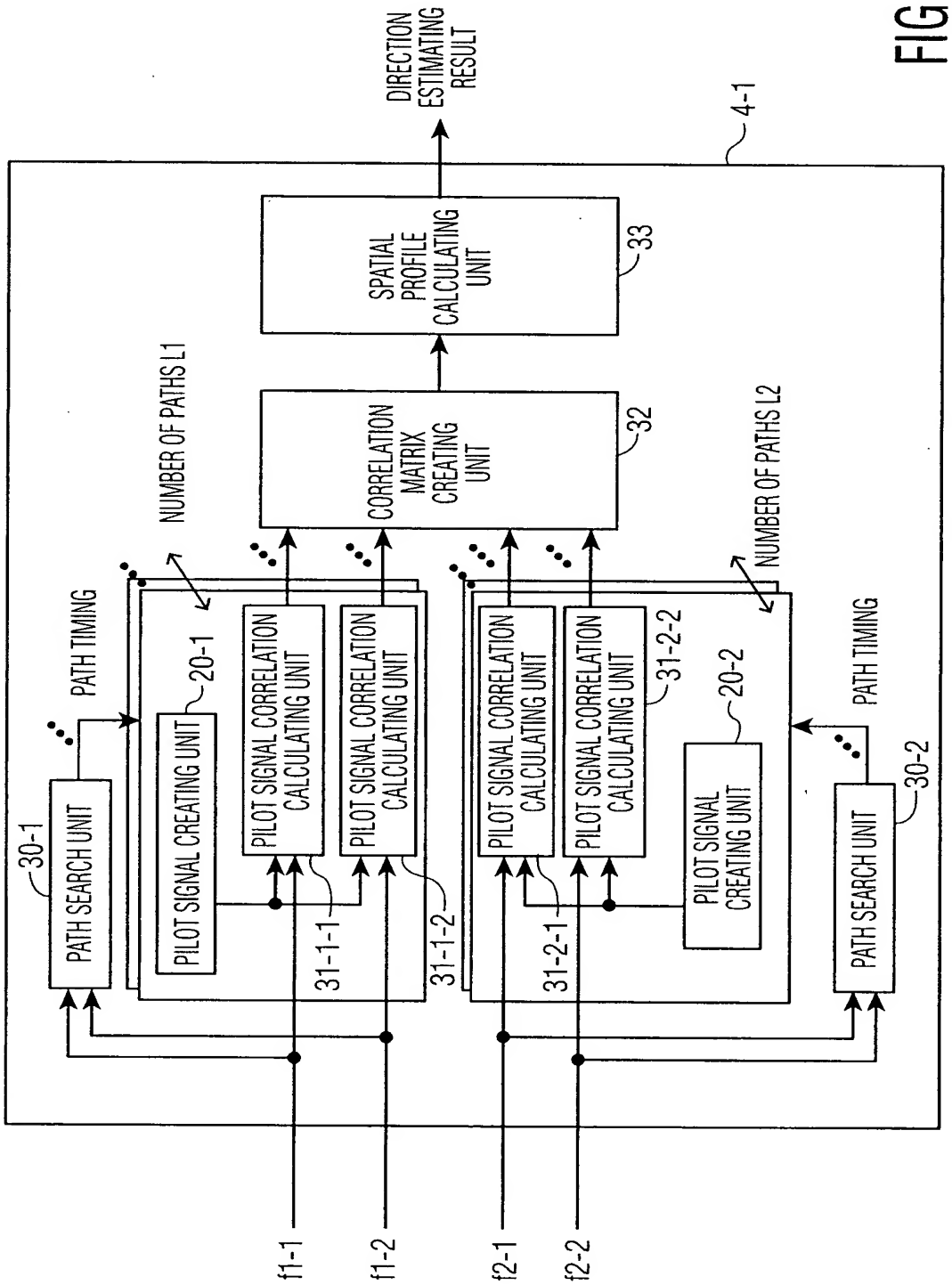

DIRECTION ESTIMATING RESULT
4-1
SPATIAL PROFILE CALCULATING UNIT
33
CORRELATION MATRIX CREATING UNIT
32
NUMBER OF PATHS L1
NUMBER OF PATHS L2
PATH TIMING
PATH TIMING
30-1
PATH SEARCH UNIT
20-1
PILOT SIGNAL CREATING UNIT
PILOT SIGNAL CORRELATION CALCULATING UNIT
PILOT SIGNAL CORRELATION CALCULATING UNIT
31-1-1
31-1-2
20-2
PILOT SIGNAL CREATING UNIT
PILOT SIGNAL CORRELATION CALCULATING UNIT
PILOT SIGNAL CORRELATION CALCULATING UNIT
31-2-1
31-2-2
30-2
PATH SEARCH UNIT
f1-1
f1-2
f2-1
f2-2

FIG. 4

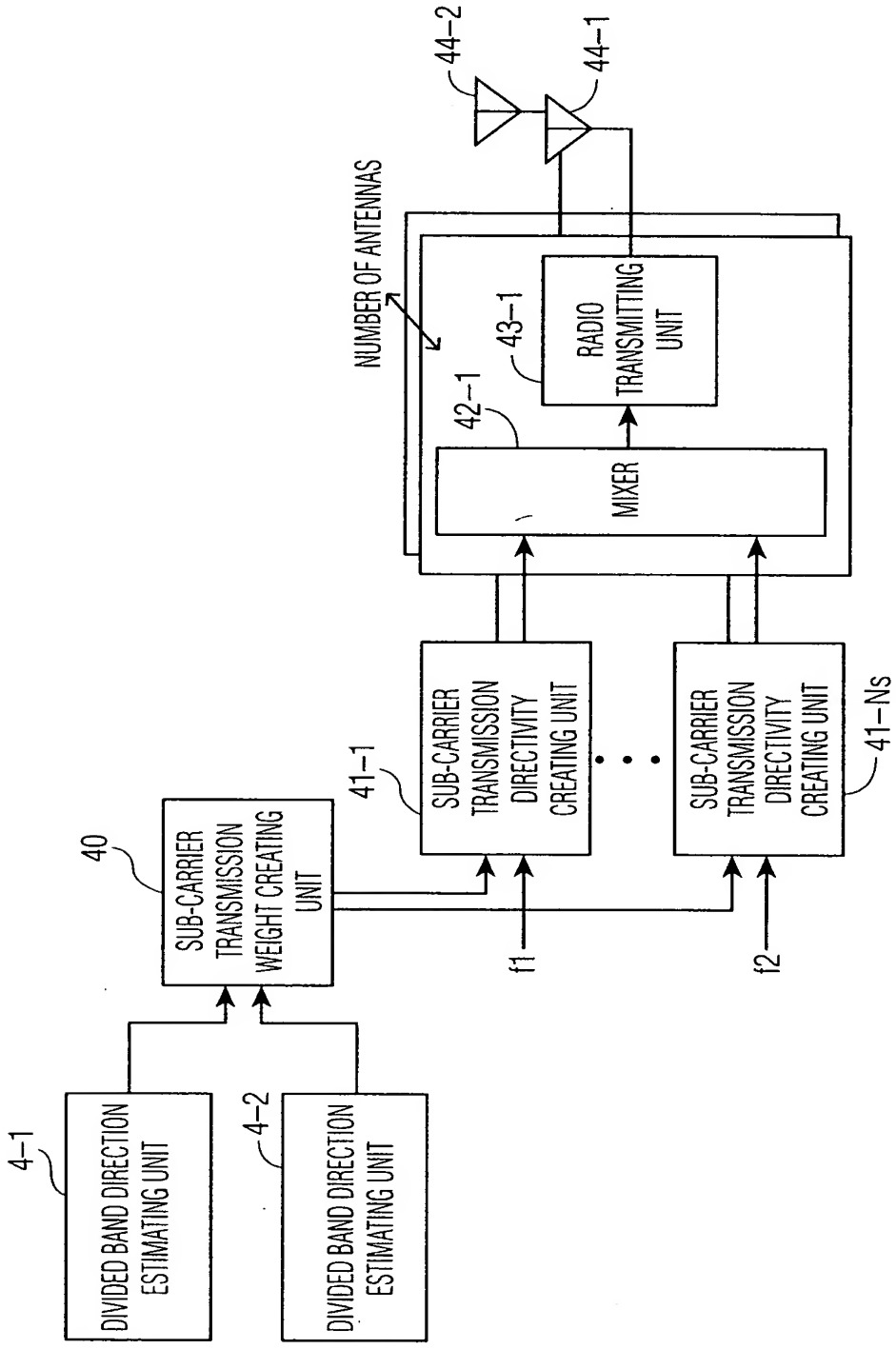

4-1
DIVIDED BAND DIRECTION ESTIMATING UNIT
4-2
DIVIDED BAND DIRECTION ESTIMATING UNIT
40
SUB-CARRIER TRANSMISSION WEIGHT CREATING UNIT
41-1
SUB-CARRIER TRANSMISSION DIRECTIVITY CREATING UNIT
41-Ns
SUB-CARRIER TRANSMISSION DIRECTIVITY CREATING UNIT
f1
f2
NUMBER OF ANTENNAS
42-1
MIXER
43-1
RADIO TRANSMITTING UNIT
44-1
44-2

FIG. 5

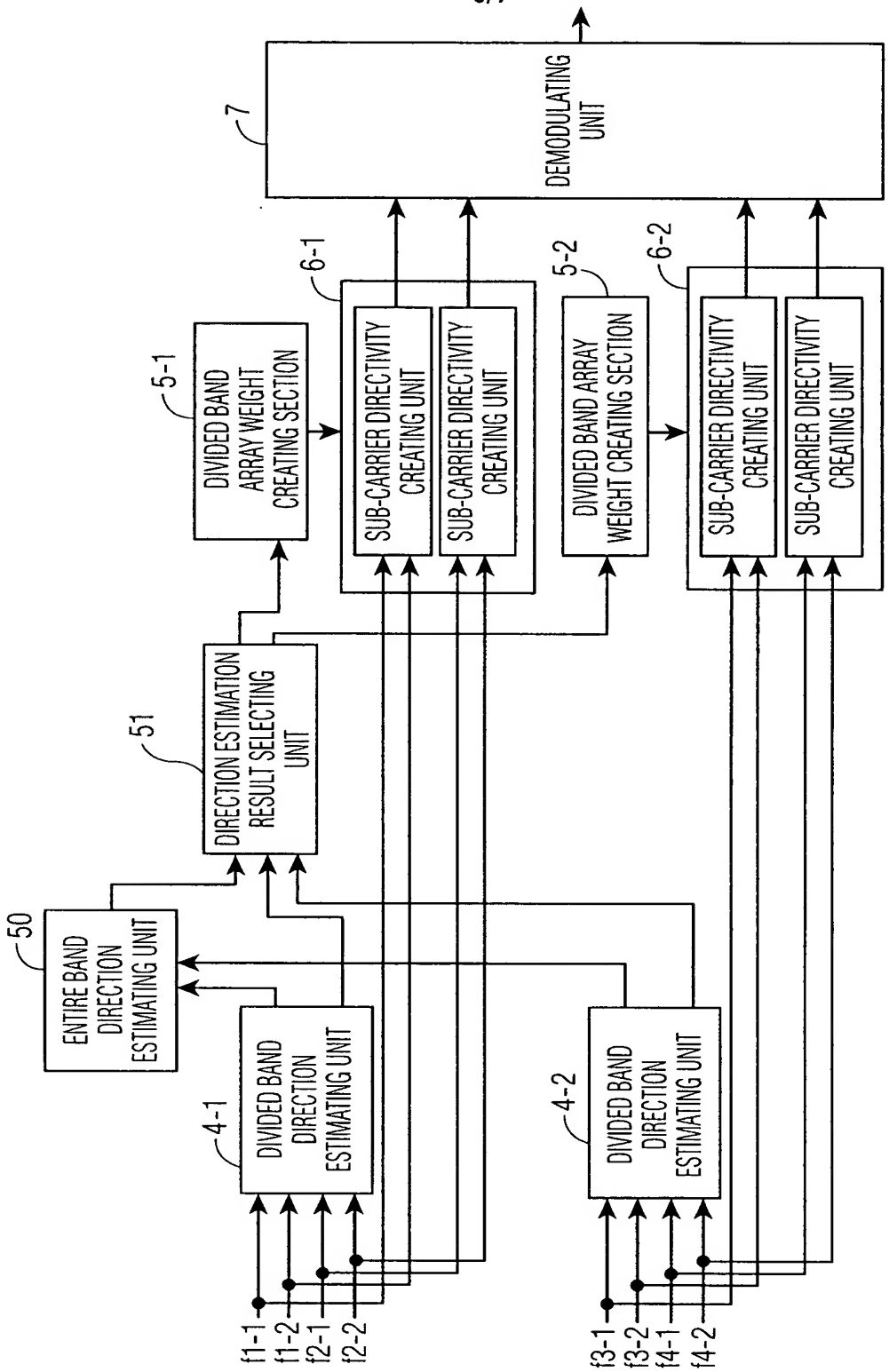

7
DEMODULATING UNIT
6-1
SUB-CARRIER DIRECTIVITY CREATING UNIT
SUB-CARRIER DIRECTIVITY CREATING UNIT
5-1
DIVIDED BAND ARRAY WEIGHT CREATING SECTION
5-2
DIVIDED BAND ARRAY WEIGHT CREATING SECTION
6-2
SUB-CARRIER DIRECTIVITY CREATING UNIT
SUB-CARRIER DIRECTIVITY CREATING UNIT
51
DIRECTION ESTIMATION RESULT SELECTING UNIT
50
ENTIRE BAND DIRECTION ESTIMATING UNIT
4-1
DIVIDED BAND DIRECTION ESTIMATING UNIT
4-2
DIVIDED BAND DIRECTION ESTIMATING UNIT
f1-1
f1-2
f2-1
f2-2
f3-1
f3-2
f4-1
f4-2

FIG. 6

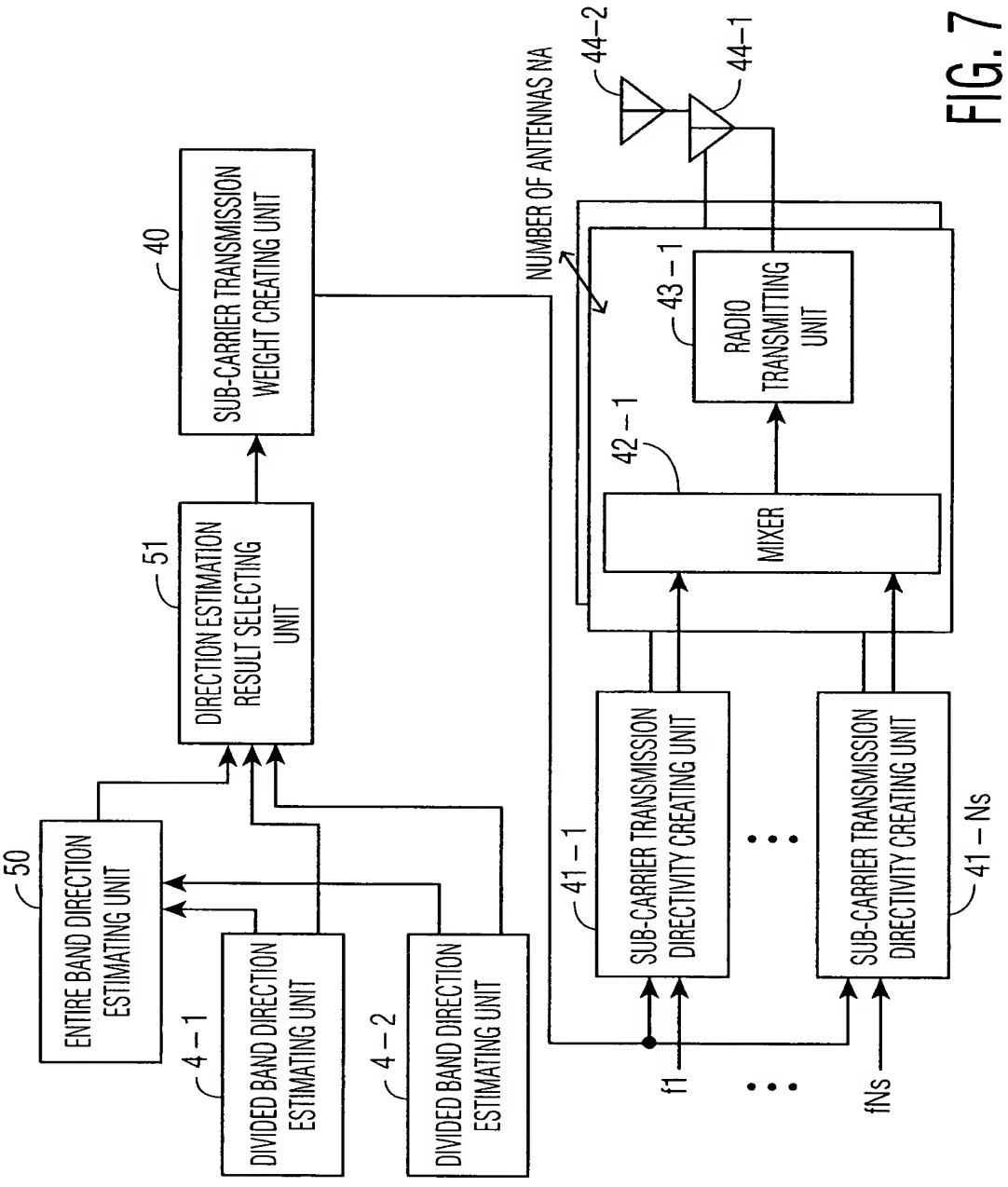

ENTIRE BAND DIRECTION ESTIMATING UNIT
50
DIVIDED BAND DIRECTION ESTIMATING UNIT
4 – 1
DIVIDED BAND DIRECTION ESTIMATING UNIT
4 – 2
DIRECTION ESTIMATION RESULT SELECTING UNIT
51
SUB-CARRIER TRANSMISSION WEIGHT CREATING UNIT
40
NUMBER OF ANTENNAS NA
SUB-CARRIER TRANSMISSION DIRECTIVITY CREATING UNIT
41 – 1
SUB-CARRIER TRANSMISSION DIRECTIVITY CREATING UNIT
41 – Ns
MIXER
42 – 1
RADIO TRANSMITTING UNIT
43 – 1
44–2
44–1
f1
fNs

FIG. 7